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10/727,802	12/04/2003	Heiko Schwarz	S&ZFH030507	6860

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EXAMINER	
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/727,802	SCHWARZ ET AL.	
	Examiner	Art Unit	
	Tung Vo	2621	

– The MAILING DATE of this communication appears on the cover sheet with the correspondence address –

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *03* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *04 October 2007*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-5,7,9,10,12 and 24-46* is/are pending in the application.

4a) Of the above claim(s) *6,8,11 and 13-23* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-5,7,9,10,12 and 24-46* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. Claims 1-5,7,9,10,12 and 24-46 are rejected under 35 U.S.C. 103(a) as being unpatentable over Said (US 7,190,840) and in view of Creusere (US 6,466,698).

Re claims 1, 10, 11, 12, 45, and 46, Said teaches a machine (510 of fig. 5) having a program for performing a method for coding transform coefficients in picture and/or video coders (fig. 1) and decoders (fig. 4) wherein for blocks of (video) pictures containing significant transform coefficients (110 of fig. 1; see also fig. 3), the coding of transform coefficients takes place in such a way that, for each block (112 and 114 of fig. 1), in a scan process (116 of fig. 1; 314, 324, and 326 of fig. 3), the positions of significant transform coefficients in the block and subsequently (fig. 2), in a reverse scan order (116 of fig. 1; 322 of fig. 3) - starting with the last significant transform coefficients within the block (col. 5, line 60-col. 6, line 2) - the values (levels) of the significant transform coefficients are determined (322 of fig. 2, Note assign codebook) and coded (118 of fig. 1); wherein by transferring a one-bit symbol (SIG) for each coefficient of a block and a one-bit symbol (LAST) for each significant coefficient of a block, a significance mapping is coded, wherein the transfer takes place in a scan order (fig. 2), (SIG) serves for identifying significant coefficients and (LAST) indicates whether there are further

significant transform coefficients in the block (326, 320, and 322 of fig. 3), wherein the decoding process the is reversible encoding process as descried (fig. 4).

It is noted that Said does particularly discloses coding a significance map specifying the positions of significant transform coefficients in the block as claimed.

However, Creusere teaches coding a significance map (fig. 3) specifying the positions of significant transform coefficients in the block (col. 10, lines 35-47).

Taking the teachings of Said and Creusere as a whole, it would have been obvious to one of ordinary skill in the art to modify the coding process (col. 10, lines 35-47) of Creusere into the encoder of Said for data movement in video is minimized in both the encoder and decoder and scratch memory requirements are greatly reduced. Doing so would allow the encoder that accepts as its input an image or video frame and outputs a stream of bits which represents that image in an efficient manner, i.e., a minimal number of bits for a specified reconstruction error.

Re claim 2, Said further discloses wherein each significant transform coefficient of the block other than the last transform coefficient of the block is characterized by a one-bit symbol (316 and 318 of fig. 3).

Re claim 3, Said further discloses wherein for each significant transform coefficient, the sign is indicated by a one-bit symbol (SIGN) (316 and 318 of fig. 3) and the magnitude is indicated by a binary-coded symbol (ABS) (encoded or coded coefficients are binary code symbol, "1" and "0").

Re claims 4 and 27, Said discloses wherein the magnitude is indicated by a symbol (ABS) in unary binarization or by a symbol (ABS) having a prefix part and a suffix part, wherein

the prefix part consists of ones and the suffix part is coded in a 0th order exp-golomb code (encoded or compressed coefficient is inherently a binary code).

Re claim 5, Said further discloses wherein blocks containing significant transform coefficients are characterized by a one-bit symbol CBP4 in connection with further syntax elements, such as, for example, CBP or macro block mode (fig. 2).

Re claim 7, Said further discloses wherein modeling for the one-bit symbol CBP4, for coding the significance mapping and/or for coding the coefficient magnitudes takes place in a context-dependent way (col. 2, lines 55-65).

Re claim 9, Said further discloses wherein block types of transform coefficients having comparable statistics are summarized to block categories (fig. 3, Note total zero and non-zero coefficients).

Re claims 24, and 33-38, Said further discloses a method for coding transform coefficients in picture and/or video coders and decoders (figs. 1-5) wherein for blocks of (video) pictures containing transform coefficients being unequal to zero (322 of fig. 3), a coding of transform coefficients takes place in such a way that, for each block, a significance map is coded (PROCESSING COFFICIENTS IN SCAN, WORKING IN REVERSE ORDER, considered as mapping, from last non-zero coefficient to the first coefficient, then coding the mapped coefficients (118 of fig. 1)), the significance map specifying the positions of transform coefficients being unequal to zero in the block in a scan order (NONE ZERO COEFFICIENTS, col. 3, lines 15-49) in a context-dependent way using contexts depending on the corresponding scan position of the transform coefficient considered (fig. 3, the context-based coding assigns different codebooks to different distributions, scan position, 214, 212, 216 of fig. 2)and

subsequently, in a reverse scan order (322 of fig. 3), starting with the last transform coefficient being unequal to zero within the block, the values (levels) of the transform coefficients being unequal to zero are coded (118 of fig. 1).

It is noted that Said does not particularly disclose using the number of transform coefficients already coded in the reverse scan order having a magnitude of 1, as required by claims 24 and 33 – 38.

However, Creusere teaches using the number of transform coefficients already coded in the reverse scan order having a magnitude of 1 (col. 8, lines 33-35).

Taking the teachings of Said and Creusere as a whole, it would have been obvious to one of ordinary skill in the art to modify the process of Creusere into the encoder of Said to allow the decoder recognized the exact transmission order of these bits. Doing so would reduce the computation of the decoding process.

Re claims 25 and 29, Said further discloses wherein when coding the significance map, each transform coefficient being unequal to zero in the scan order is characterized by a first one-bit symbol (SIG) serving to characterize transform coefficients being unequal to zero, i.e. each transform coefficient being unequal to zero including the last transform coefficient being unequal to zero in the scan order if it is different from the last transform coefficient of the block in the scan order, or excluding the last transform coefficient being unequal to zero in the scan order if it is the last transform coefficient of the block in the scan order, and the last transform coefficient being unequal to zero is characterized by a second one-bit symbol (LAST) indicating that the respective transform coefficient being unequal to zero is the last transform coefficient being

unequal to zero in the scan order if it is different from the last transform coefficient of the block in the scan order (fig. 3; see fig. 2 for different scans order).

Re claim 26, Said further discloses wherein for each transform coefficient being unequal to zero, sign is indicated by a one-bit symbol (SIGN) (316 and 318 of fig. 3) and the magnitude is indicated by a binary-coded symbol (ABS) (encoded or coded coefficients are binary code, 1 and 0).

Re claim 28, Said further discloses blocks containing transform coefficients being unequal to zero are characterized by a one-bit symbol (CBP4) in connection with further syntax elements, such as, for example, (CBP) or macro block mode (fig. 2).

Re claim 30, Said further discloses wherein modeling for the one-bit symbol (CBP4) (fig. 2, Macroblock), for coding the significance map (codebook, col. 3, lines 15049) and/or for coding the coefficient magnitudes takes place in a context-dependent way (col. 2, lines 55-65).

Re claim 31, Said further discloses wherein no significance information (SIG, LAST) is transferred for the last scan position of a block (320 of fig. 1, Note code last non-zero coefficient).

Re claim 32, Said further wherein block types of transform coefficients having comparable statistics are summarized to block categories (All Scan = 0, 314 of fig. 3).

Re claim 42, 43, and 44, Creusere further teaches wherein coding the transform coefficients in the reverse scan order also comprises coding x-th bins with x>14 of the magnitude of the transform coefficients using a non-adaptive context (col. 11, lines 23-37); wherein coding the significance mapping comprises coding the symbols SIG and LAST context-adaptively by use of context numbers indicated by the corresponding scan position of the transform coefficient

considered, with the context numbers for SIG and LAST being different (col. 5, lines 35-36); wherein coding the significance mapping and coding the values of the transform coefficients is performed by arithmetical coding (fig. 10 (a)).

3. Claims 39-41 are rejected under 35 U.S.C. 103(a) as being unpatentable over Said (US 7,190,840) and in view of Creusere (US 6,466,698) as applied to claims 24 and 33, and further in view of Karczewicz et al. (US 6,856,701).

Re claims 39-41, the combination of Said and Creusere does not particularly disclose binarizing a magnitude of a each transform coefficient into a sequence of bins, determining a context for the first bin of the magnitude of each transform coefficient based on a number of transform coefficients already coded in the reverse scan order having a magnitude of 1, context-adaptively coding the first bins of the transform coefficients using the determined contexts.

However, Karczewicz teaches binarizing a magnitude of a each transform coefficient into a sequence of bins, determining a context for the first bin of the magnitude of each transform coefficient based on a number of transform coefficients already coded in the reverse scan order having a magnitude of 1, context-adaptively coding the first bins of the transform coefficients using the determined contexts (fig. 7b, Bin to level is mapped, context).

Taking the teachings of Said, Creusere, and Karczewicz as a whole, it would have been obvious to one of ordinary skill in the art to modify the teachings of Karczewicz in to the combined process of Said and Creusere in order to provide the possibility of improved data compression. Doing so would increase coding efficiency.

Conclusion

4. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL.** See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Contact Information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tung Vo whose telephone number is 571-272-7340. The examiner can normally be reached on Monday-Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mehrdad Dastouri can be reached on 571-272-7418. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Tung
Primary Examiner
Art Unit 2621